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New Plants from Idaho and from other Localities of the Northwest

BY L. F. HENDERSON

LEPIDIUM MONTANUM **papilliferum**

Nearly the whole plant, especially the stamens, covered with papillae, which seen in optical section are club-shaped, oblanceolate or obovate, and bright white : radical leaves more divided than in the type, ordinarily bipinnate, and on young plants thickly rosulate : stem inclined to branch more from the base : pod more nearly round.

This plant I should call *L. papilliferum*, deeming it a good species, were it not that I find the pod quite variable in typical *L. montanum*, the leaves running in some cases from pinnate to bipinnate, and a very few papillae occasionally present on some parts of the plant, even on Nuttall's type, with occasionally a very few *hairs* in place of papillae on the filaments but never papillae, as far as I have examined the material in the Gray Herbarium. No. 4121. Growing amongst species of *Artemisia* and *Bigelovia* on the plains about Nampa, southern Idaho, July 30, 1897. The same plant was collected by Miss Mulford at the same place, July 1, 1892. As the plants were nearly as much advanced as were mine, the difference in season is to be accounted for by my plants having been collected near an irrigating ditch, where they flowered late into the summer.

Types in the Gray Herbarium ; cotypes in the National Herbarium, in the Idaho Herbarium and in my private collection.

Sisymbrium perplexum

Annual, or possibly biennial, 15–35 cm. high, branching from the base or near it with many wiry ascending branches, pubescent more or less strongly with a stellate pubescence : radical leaves 1–3 cm. long including the petiole, spatulate to oblanceolate, repandly dentate to pinnatifid or nearly entire ; cauline leaves oblong-oblanceolate, slightly pinnatifid to entire, sessile or petioled : flowers small, white or slightly tinged with purple : pods on pedicels 5–8 mm. long, more or less torulose, curved or straight, 10 mm. long or more : seeds granular, with incumbent cotyledons : stigma nearly entire, projecting slightly over the placentae: septum with a broad central nerve, conspicuously celled, the cells in and near the nerve longitudinally elongated, those of the wings very irregularly oblique or transverse.

A singular species, simulating *Braya humilis* remarkably, but differing in the slightly more-lobed leaves, petals with slightly broader claws, a less stellate inflorescence, longer pedicels, and the very peculiar septum. Were it not for this latter peculiarity, the plant might well be considered a variety of *Braya humilis*, but the broad nerve and different cell structure of the septum separate it from this genus, if they do not even invalidate the generic standing of *Braya*. No. 3037. On a dry slope under *Pinus ponderosa*, Salmon River Canyon, beyond Florence, Idaho, July 1, 1895. Altitude about 4800 ft.

Type in the National Herbarium; cotypes in the Gray Herbarium, in that of the University of Idaho, and in my private collection.

Arenaria Salmonensis

Caudex ligneous, much branched below the surface of the ground: stems delicate, 6–8 cm. high, glabrous below, glandular above: fascicled leaves few, glabrous, serrate-margined, about 1 cm. long, acerose, acute; cauline similar but slightly shorter, arcuate or erect: cyme loose, 2–4 times divided, the bracts very scarious, ovate, 1-nerved, 1–2 cm. long: pedicels 2–6 mm. long, these as well as the sepals minutely glandular: sepals 2–3 mm. long, ovate, very obtuse when the scarious edge is well developed or acutish when the edge is less developed: petals a half longer than the sepals, narrowly oblanceolate, obtuse or somewhat erose at apex: stamens commonly 10: pod slightly exceeding the sepals, with 2-cleft valves.

Very near to *Arenaria subcongesta*, but differs in smaller stature, smaller flowers, and fewer radical tufts of leaves.

No. 3505. Dry, gravelly plains, near the source of Salmon River, Blaine County, Idaho, July 20, 1895, near 6500 ft. alt.

Lupinus erectus

25–35 cm. high, erect, many-stemmed, herbaceous, closely appressed canescent to silky, few-leaved, branching slightly above with apparently sterile branches, with peduncle about 5 cm. long: radical leaves very numerous, the petioles twice to thrice exceeding the leaflets, these linear-oblong to narrowly oblanceolate, acute to acuminate, 5 to more commonly 8 in number, 1.5–4 cm. long, appressed silky-canescent on both sides; cauline leaves 2 or 3, with shorter or very short petioles: stipules adnate, subulate: raceme dense, cylindric, 8–9 cm. long by 2 cm. wide: bracts persistent, exserted and recurved before anthesis, in anthesis equaling the calyx, lanceolate to narrowly subulate: flowers 7–8 mm. long, on pedicels less then 2 mm. long, sub-verticillate: calyx silky, with subequal lips and very small bractlets; the lower lip entire, the upper cleft for two-thirds its length: standard obovate to orbicular, silky, reflexed: keel short-pointed, ciliate: ovary 3–4 seeded, silky: pod unknown.

Differs from *L. canescens* Howell, in much smaller stature, fewer flowers, leaflets not densely appressed, and shorter racemes. From *L. lepidus* it differs in not being densely silky, bracts persistent, banner silky, shorter pedicels, entire lower calyx-lip, flowers smaller, and ovules fewer. From *L. confertus* it differs in less branching character, shorter pubescence, shorter peduncle, entire lower calyx-lip, smaller petals, not narrowly ovate but obovate orbicular silky banner.

No. 3088. Rather dry ground, Long Valley, Boise County, Idaho, July 4, 1895, altitude over 4000 ft.

Type in the National Herbarium; co-type in my private collection.

Lupinus retrorsus

Perennial, 6–9 dm. high, erect, simple or branching, softly hispid-villous with spreading or strongly retrorse white hairs, leafy, rather long-peduncled: leaves with retrorsely hispid petioles; leaflets from as long to half as long as the petioles, greenish villous above, whitish villous below, 4–7 cm. long, narrowly oblanceolate, acuminate or merely acute; stipules long setaceous, silky within, hispid without: raceme from 6 cm. in length when in flower to 30 cm. in fruit, densely flowered but verticillate, apparently few pods maturing: bracts quite persistent, long subulate-aristate, hispid, longer than the buds and many of the flowers: pedicels 1–4 mm. long, with the calyx very villous: flowers 8–12 mm. long: calyx broad at base, slightly saccate, shortly bracteolate, with upper lip broad, shorter then the lower, and cleft into two short broad lobes; lower lip broad, subentire, or with 3 short lobes; banner hairy, broadly obovate, rather retuse from the slightly cohering sides: keel ciliate, rather shortly pointed: pod densely villous with white hairs, 2 cm. long, ripening 3–4 of the 5–6 ovules: seeds small, pinkish-brown and mottled with small brown spots.

Apparently nearest to the next, but very distinct from any *Lupinus* with which I am acquainted.

No. 4608. Low, grassy places, along dry or drying rills, hills of Cœur d'Alene Lake, opposite Harrison, Idaho, August 7, 1898. Flowers were mainly gone at this time. Type in the Gray Herbarium; co-types in my private collection and in the herbarium of the University of Idaho.

LUPINUS LIGULATUS **barbatus**

Differs from the type of *L. ligulatus* Greene, in having stipules not adnate, stem hairy, leaflets more than 6–8 (about 9), raceme long-peduncled, flowers scattered, only 8–10 mm. long, and in the ovary not very villous.

This was referred for me to "*Lupinus Burkii?*" but it differs from that species in its very different pubescence, not broad stipules, in long and open raceme, deciduous bracts, ovules 6–7, I should almost hesitate to refer this plant to *Lupinus ligulatus*, were it not that a specimen is in the Gray Herbarium, collected in Klamath County, Oregon, by Applegate, which more nearly approaches the type in its stipules adnate below, free above, and flowers only 8–10 mm. long. No. 1699. Wet, sunny, clay banks, Glendale, southern Oregon, May, 1897 and 1898.

Type in the Gray Herbarium; co-types in my private collection.

Aster Cordalenus

Growing in clumps, nearly erect, 20–30 cm. high, slender, much branched and leaved, especially above, glabrous below, pubescent above, the rather short branches corymbosely aggregated at top of stem: leaves linear to narrowly oblong-oblanceolate, uppermost lanceolate, 5–8 cm. long, 5–10 mm. wide, entire or some with a few rather distant serratures near the middle, those of the inflorescence not much reduced, strongly ciliate, otherwise glabrous, clasping to strongly auriculate at base: heads very foliaceous, campanulate to hemispherical, 5–7 mm. high by 7–10 wide: outer series of involucral bracts entirely foliaceous, loose, widely linear, acute, exceeding the inner or even exceeding the rays; inner bracts narrower, more or less white with herbaceous tips: rays about 20, blue to violet, 8–10 mm. long: disk-flowers purple, with rather short tube and pappus: akenes from nearly glabrous to strongly pubescent.

This plant is certainly closely related to some of the forms of *Aster foliaceus*, but differs from any of the varieties of this species, (or from any of these *species* more probably), in the smaller heads with even proportionately larger involucral bracts, more crowded stems, corymbose inflorescence, and more abundant smaller leaves tending to become condensed at top of stem. From *A. Oreganus*, which it resembles in general habit and size of heads, the very different involucral bracts completely separate it. No. 2992. Moist gravelly bars, Fort Sherman, Lake Cœur d'Alene, Idaho, August 22, 1897. Types placed in the Gray and National Herbaria, as well as in the herbarium of the University of Idaho, and in my private collection.

Aplopappus insecticruris

Upright or nearly so from erect or ascending rootstocks, 30–40 cm. high, leafly, more or less villous with many-celled and jointed white hairs: radical leaves 8–10 cm. long on petioles of nearly equal length, the blades almost glabrous, petiole and ordinarily midrib villous, subcoriaceous, serrate with rather distant triangular-spinulose teeth, oblanceolate, acute to acuminate; cauline decreasing slightly in size towards the heads, lanceolate to oblong, below shortly petioled, above sessile and clasping, pectinately serrate: heads 1.5–2 cm. high by 2–3 cm. wide: bracts of the involucre loose, about equal in length or the outer foliaceously enlarged and exceeding the head, linear-lanceolate, in 2 or 3 series, subcoriaceous, acute to pungently acuminate, outer villous-pubescent below, glabrous above, inner chartaceous at base: rays conspicuous, light yellow, 1.5 cm. long, about 20 in number: disk-corollas exceeded by the tawny rigid strongly-toothed pappus: style-appendages very hairy, longer than the stigmatic portion: akene from narrowly oblong to shortly subturbinate in different heads of the same plant, thickly covered with coarse more or less appressed dull-white or tawny hairs.

Near to *A. hirtus*, but differing in the nearly glabrous and larger leaves, less wooly stem, larger heads with smoother involucral bracts, coarser pappus, and more pubescent style-branches. The akenes, though similar in the main to those of *A. hirtus* in shape and covering, are inclined to be larger. The peculiarly articulated hairs, resembling the legs of many species of insects, though by no means peculiar to this species or even genus, suggested the name.

No. 3013. Dry, stony ground, western end of Big Camas Prairie, Blaine County, Idaho, July 14, 1895. Type in the National Herbarium; co-types in the Gray and Idaho University Herbaria, as well as in my private collection.

Aplopappus laceratus

Less than a span high, whole plant glandular with short stipitate glands, more or less leafy to the top: leaves rather thin and soft, radical spatulate to narrowly oblanceolate, cauline linear-lanceolate to narrowly linear, green, with long-ciliated margins, 1–4 cm. long, obtuse or acute: involucre campanulate to hemispherical, 1 cm. high and wide, its bracts subequal in two or three rows, lanceolate, acute to acuminate, outer ones green or purplish, inner mainly thin-chartaceous, all with hyaline margins which for the lower half at least are ciliate to pectinately-lacerate: corolla ampliate upwards, deeply 5-toothed, with style-appendages subulate and slightly longer than the stigmatic portion: pappus soft, white, not abundant, equaling the corolla: akenes sub-cuneate, striate, densely sericeous.

Close to *A. Lyallii* as well as to *A. pygmaeus*, but differing decidedly from both. From the first it differs in the more lacerate involucral scales, long-ciliate narrower leaves, shorter and broader akenes, and in the compactly caespitose rootstock. From *A. pygmaeus* it differs in being glandular, in having no broad obtuse outer scales, and in the silky, not pubescent, shorter akenes.

No. 3014. In moist ground amongst rocks, Soldier Mountain near Big Camas Prairie, Blaine County, Idaho, at an elevation of over 10,000 ft., July 15, 1895.

ANTENNARIA DIMORPHA **integra**

Plant spreading, with no well-defined caudex: hairs upon the akene almost altogether entire.

I should hesitate to regard this as a mere variety, in spite of its resemblance to the type, were it not that from its usual habit of spreading by slender, much-divided rootstocks it occasionally departs in the formation of quite a decided caudex, which is, however, in all cases more slender than any form of *A. dimorpha* in the Gray Herbarium; secondly, though the hairs in most cases show no division at all, while the ordinary forms of the species show hardly any simple hairs, yet now and then a hair can be found with notched apex, or with even recurved lobes.

No. 3036. Sandy, dry ground, Long Valley, Boise County, Idaho, at an elevation of 4100 ft., July 5, 1895. Type in the National Herbarium; co-types in the herbarium of the Idaho University and in my private collection.

CIRCIUM UNDULATUM ciliolatum

Differs from the type in having the bracts noticeably ciliolate.

I should hesitate to call this a variety rather than a species, were it not that I find hardly a single specimen of *C. undulatum* in the Gray Herbarium that has not a few slightly ciliated bracts, and that it has all the other characters of the species. In having ciliolated bracts it approaches *Circium Grahami*, but differs from that species in more cottony leaves and involucre, smaller stature, and in more prickly involucral bracts.

No number appears with the specimens. I collected this in dry fields near Ashland, southern Oregon, July 8, 1886. Type in the Gray Herbarium; co-type in my private collection.

LYGODESMIA SPINOSA lanata

Differs from the type only in being lanate all over, stem more striate, and rather longer peduncles. No. 3229. Gravelly banks and bars of Wood River, Hailey, Blaine County, Idaho, July 21, 1895. Type in the National Herbarium; co-types in the Idaho University herbarium and in my private collection.

Microseris nigrescens (§ *Nothocalais*)

Scapes 26 cm. high from a thick caudex, glabrous save for a little pubescence below the head: leaves 3–24 cm. high, linear, widest above the middle, 3–10 mm. wide, pale green, with plane and entire margins, glandular mucronate at apex: involucres 15–20 mm. high, campanulate, the bracts subequal, lanceolate, acuminate, very thin and scarious, mottled with small dark dots: akenes 6–7 mm. long, narrowly fusiform, with rather short neck, the seed reaching almost to the top of the nearly black akene: pappus exceeding the akene, white, from $\frac{1}{5}$–$\frac{1}{3}$ mm. wide, attenuate from near the base: rays purplish on the outside, exceeding the involucre by about 5 mm.

Certainly closely related to *M. troximoides*, but differing from this species in the smaller nearly black akene, in the very fine pappus, not half so wide as in that species, and in the rather wider, softer leaves with unwrinkled margins. A nearer approach still to *Troximon*.

No. 3033. Wet meadows, Hot Springs, near Warren's Mining Camp, Idaho County, Idaho, July 2, 1895. Type in my private herbarium; co-type in the National Herbarium.

Whatever claim *Stephanomeria myrioclada* may have to specific rank, a thing I very much doubt, it is certain that Dr. Gray confused two plants in his description of this species in the Synoptical Flora. Eaton's type has the pappus just as he described it in the Botany of the King Exploration—"plumose nearly or quite to the base." Dr. Gray, after his description, cites two plants, one the Eaton plant, collected by Watson, the other the Hawthorne, Nevada plant, collected by M. E. Jones. The label attached to the latter bears this inscription: "*S. lygodesmoides* M. E. Jones, n. sp." It is so entirely different from *S. myrioclada* that I do not hesitate to describe it, since Mr. Jones assures me he has never done so.

Stephanomeria lygodesmoides M. A. Jones

Erect from a woody or even "shrubby" base, glabrous, with numerous rather stout ascending branches throughout: lower cauline leaves not seen; upper narrowly linear, less than 2.5 cm. long, ascending or pendent, entire, acute, the smaller bract-like and squarrose: head 4 mm. high, the involucre of 4 principal bracts and the same number of bractlets: flowers 3–5: akenes smooth, angled, with sordid pappus which is very plumose halt way down, the remaining part scabrous.

Probably the same thing, or near it, is in the Gray Herbarium from S. B. Parish, no. 3228, but the branches are thicker and more divaricate, the leaves slightly runcinate-pinnate, and the plant even woodier at base. Mr. Jones assures me that his plant was also very woody at base. The akenes of both plants exactly match. These two plants are certainly near Greene's *Ptiloria divaricata*, but he describes his species, which I have not seen, as herbaceous to the base, and with monocephalous branches, while this plant has often two heads to the branch, and the pappus is not "joined into bundles of three at base."

Nemophila inconspicua

Small, depressed, glaucous, with the leaves and calyx much more strigose than the stem; leaves 5-lobed to parted, with rounded or obtusely triangular lobes, blade round to ovate in outline and more or less decurrent on the petiole: corolla equaling calyx or slightly shorter: appendages of the calyx ovate, a quarter the length of the ovate-lanceolate lobes: corolla white, 2.5 mm. long, the widely oblong lobes equaling the tube: stamens about equaling the tube, with small cordate anthers, the filaments attached from near the base to one third the way up the tube: internal appendages of the corolla small, narrow, attached to their bases, either acuminate or delicately fimbriate at apex in the same flower: style rather conspicuous and cleft to near the middle: seeds 4, the strong caruncle disappearing with age, deeply pitted, and with innumerable small punctures between the pits.

It simulates small forms of *N. parviflora*, and also of *N. breviflora*, but differs from both very materially. From *N. parviflora* it differs in the short corolla, shape and attachment of internal appendages, shape and size of anthers: from *N. breviflora* in the number of seeds, smaller appendages to the calyx, equality of corolla tube and lobes, shape of internal appendages, and noticeably 2-cleft style; from *N. spathulata* Coville in manifest style, presence of internal appendages, and round capsule.

No. 3289. Loose, moist soil, Soldier Mountain, Blaine County, July 16, 1895. Type in the National Herbarium; co-type in my private collection.

Nemophila Kirtleyi

From 5–20 cm. in height, diffuse and weak; stems leafy to the top, purplish, shortly hispid below, longer hispid above, the hairs strongly divergent to retrorse; all the lower leaves opposite, the upper alternate, ovate in outline, irregularly 5-parted with oblong to ovate lobes, these latter rarely 3-lobed or strongly dentate, slightly retrorse; petioles destitute of auricles, but narrowly winged, hispid-ciliate, as are the sepals and to a less degree the petals: appendages of the calyx ovate, less than ⅓ the length of the lobes; these lanceolate, enlarging in fruit, nearly as long as the lobes of the corolla: corolla one-half to three-quarters of an inch wide, with violet border and whitish center, conspicuously green-spotted near the junction with the stamens: internal appendages conspicuous, half fan-shaped, attached along the greater part of one side, cut into many lobes, these delicately fimbriate: stamens slightly over half the length of the corolla, with anthers oblong-sagittate, retuse, 2.5 mm. long: style half as long as the sepals, cleft one third the way down: peduncles slightly longer than the leaves and proceeding from their axils: pod 4-ovuled, 2–4-seeded: seeds oval, large, deeply pitted.

In aspect the plant resembles small forms of *N. phacelioides* Nutt., but easily separable from that species in opposite leaves, smaller stature, vari-colored corolla, and deeply pitted seeds, to say nothing of its far different range. From *N. aurita* it differs in absence of winged petioles and clasping base of leaves, less divisions to the leaves, and color of flowers. From *N. racemosa* it differs in not having a racemose inflorescence and in larger flowers.

No. 3082. Growing in warm, loose soil under *Pinus ponderosa*, Salmon River hill, beyond Florence, Idaho County, July 1, 1895.

I take pleasure in dedicating this species to my young friend and companion of my 1895 trip, Charles Kirtley, of Salmon, Idaho.

Type in the National Herbarium at Washington, co-types in the herbaria of Idaho and Harvard.

Phacelia minutissima

Annual, 2–6 cm. in height, hirsutely pubescent, glandular above, branching from the base, erect: leaves narrowly oblanceolate to spatulate, the base narrowed into a slender petiole, the blade entire or rarely slightly denticulate: flowers not numerous, shortly pedicelled: sepals spathulate-linear, 2–4 mm. long, moderately or far surpassing the small, bluish-white, oblong-campanulate corolla: the appendages of the latter not long, somewhat v-shaped at the base of the filament: anthers not small for size of flower, on filaments rather stout and one half to two thirds the length of the corolla: capsule rather large, ovate, acute: seeds 1–1.5 mm. in length, somewhat angled by pressure, oval-oblong, marked with a delicate net-work of roundish figures.

Very near to *P. saxicola* Gray, but it differs from that species in seeds being 3 or 4 times larger, (those of *P. saxicola* being only 0.35 mm. in diameter), not round but widely oblong and with much smaller reticulations, in shorter corolla, larger anthers on shorter thicker filaments, in appendages not so "linear" but shorter and making a much more noticeable angle at their juncture with the stamen base.

No. 3386. Dry, gravelly or rocky ground, at 8000 feet elevation, Soldier Mountain, Blaine County, July 16, 1895.

Type in the Washington Herbarium, co-types in the Idaho and Gray herbaria.

Chionophila Tweedyi

This plant was published in the Botanical Gazette, **15**: 66 as *Pentstemon Tweedyi* by Canby & Rose. This the writer thinks an error, which is probably due to the lack of mature fruit when the species was named. The serious question is, not whether it is not a *Pentstemon*, but whether it should not be raised to generic rank. For some time the writer was impressed with the necessity of making a new genus to fit this plant, but the more carefully he weighed each point the more convinced he was that the plant could more naturally be placed in *Chionophila*. The reasons will now be given, while at the same time the really generic characters will not be overlooked.

The genus *Chionophila* was based by Bentham on specimens collected by Dr. James on Pike's Peak in Colorado, and the monotypic species was named for the discoverer. Many specimens of this plant are found in the Gray Herbarium, and they all show the characters as described by Bentham. The most important are a close spicate inflorescence which is noticeably secund; a small glabrous plant, rising from a thick rhizoma; radical leaves with very scarious bases; very large and long calyx; corolla with 4 perfect stamens and one sterile one of much less length, and a many-ovuled ovary. Mr. Bentham had not seen the capsule, but Dr. Gray in the Synoptical Flora describes the seeds as "rather large, oblong, with a very loose and arilliform cellular-reticulated outer coat." I have also noted in some of the corollas I have examined in the Gray Herbarium that they are not perfectly straight at base, but a little larger on one side than the other. The proposed *Chionophila Tweedyi* agrees with this plant generically in the following points. It is about the same height, has just such leaves, the radical with wide scarious bases, and I note in both the same scarious *bracts* surrounding the leaves besides the *leaf-bases* of former years; similar opposite and sheathing cauline leaves; very similar fertile and sterile stamens, the former with equally confluent cells; very similar seeds, the description given by Dr. Gray for *C. Jamesii* fitting *C. Tweedyi* exactly; furthermore the two plants both blacken readily in drying. On the other hand the points of dissimilarity are more apparent than real. The flowers of *C. Jamesii* are arranged in a one-sided spike, those of the other in an open fewer-flowered raceme; the corolla of *C. Jamesii* is nearly if not quite straight, that of the other is quite saccate at base dorsally, thus causing the corolla to be turned aside at quite a strong angle with the axis of inflorescence and nearly erect pedicels; the calyx of *C. Jamesii* is large and "funnelform," that of *C. Tweedyi* is short and more lobed; while the lower lip of *C. Jamesii* is coated with a thick mat of hairs, the lower one of *C. Tweedyi* is merely strongly papillate.

To sum up, then, the two plants resemble one another in the ovary and seeds, in the stamens fertile and sterile, in the upper parts of the corollas, in the leaves and their bases, and in their blackening when dried. They depart from one another in the inflorescence, in the corolla-base, in the hairiness of the lower corolla-lip, and in the shape of calyx. The seeds and corolla base would cut the plant off from *Pentstemon* more than from *Chionophila*. Neither could the plant be placed in *Collinsia*, though having the gibbous base of this genus, as the stamens are not enclosed in the keel-shaped sac of the lower lip, nor are the seeds "peltate and concave centrally," while the sterile filament is not a mere gland. For these many reasons it seems best to the writer to transfer the plant to *Chionophila* rather than to constitute a new genus for it.

No. 3883. It grows in Idaho, wherever I have found it, not in swampy ground, as Mr. Tweedy finds it, but in open, loose soil at the bases of mountains.

Idaho County in flower, July 2, 1895. Flowers nearly white with tinge of purple. Custer County in fruit, August 2, 1895. Altitude about 6000 ft.

Type in the National Herbarium, co-types in the Idaho and Gray herbaria.

Castilleia Covilleana

Stems numerous from a subvertical rootstock, about 15 cm. high, leafy from the base, throughout glandular as well as villous with long crisped hairs, especially above: leaves narrow, entire at base, 3-parted above into linear more or less circinate lobes, 2–3 cm. long: bracts broader, 3-parted and the central lobe 2–3-cleft, some noticeably circinate, about equaling the flowers: calyx equaling or slightly surpassed by the corolla, *much deeper cleft behind than before*, the divisions shortly cleft into lanceolate acute lobes, glandular and villous : corolla slightly villous, conspicuously glandular above, with tube twice the length of the lower lip ; lip somewhat saccate with three deeply infolded narrow plicae slightly longer than the three erect light-colored subconvolute acute or obtuse lobes : style shortly exserted, with conspicuous 2-lobed stigma : anterior stamens equaling the corolla.

This plant approaches *C. breviflora* Gray in the unequally cleft calyx and the triple pliae or folds of the lower lip of the corolla, but it differs from that species in the calyx being cleft more deeply posteriorly than anteriorly, in the narrower less lobed leaves, in the glandular stem and inflorescence, as well as in the longer crisped hairs, and in the lower lip of the corolla being concealed below the anterior cleft of the calyx. From the first and last of these differences, it seems to constitute a new section in *Castilleia*, provided these characters are found to be constant.

Among rocks, between 10,000 and 11,000 ft. elevation, Soldier Mountain, Blaine County, July 15, 1895. No. 3388. Type in the National Herbarium ; co-type in the Idaho Herbarium.

I take pleasure in dedicating this unique species to Mr. Coville, botanist of the Agricultural Department at Washington, through whose instrumentality I was enabled to take the trip in 1895, and to whom I am indebted for the loan of additional material for comparison.

SALIX LONGIFOLIA **tenerrima**

Differs from the type in the following characters :

A smooth shrub, 2–4 meters high, with light bark up to the youngest branches : leaves shorter and narrower, 1–2 mm. wide on fructiferous branches, 2–4 mm. wide on the sterile, glabrous or very early glabrate : pedicels slightly longer, capsule glabrous : scales glabrous save for the slightly ciliate edges.

Shaded, rocky banks of mountain rills gone dry in July, Elmore County, where the type was collected, as well as sandy bottoms, Payette River, Canyon County, Idaho, July 12, 1895, and August 1, 1897.

This beautiful bush has often been referred to *Salix exigua* of Nuttall, but it cannot be that, as Nuttall describes his plant "foliis sericeis—capsulis sessilibus." Neither can it be his *S. fluviatilis*, as he describes that species with leaves twice as wide, stipules none, scales of the female catkin bearded below. Furthermore, he describes *S. fluvistilis* as abundant at the confluence of the "Oregon and Wallamet." I have never seen this variety west of the Cascade Mts.

Type in the National Herbarium; co-types in the Herbarium of the University of Idaho and in the Gray Herbarium.

Allium simillimum

Stems 2.5–3 cm. high from the bulb, slender, flattened and very narrowly winged; bulb ovate, 8–12 mm. long, loosely covered with many membranous layers, the reticulation of which runs from long rectangular above, through square, to figures below wider than long and from pentagonal to heptagonal: leaves 2, about 1 mm. wide, 8–9 cm. long, falcate to recurved; bracts 2, broadly ovate, acute or acutish: flowers 6–9, 5–6 mm. long, on slender pedicels 2–3 mm. long; segments narrowly oblong, obtuse, delicately denticulate with spreading papillae half the way up, pinkish white, with strong greenish midvein; stamens half to two thirds the length of the segments, the filaments broadened at base and attached for ⅓ their length to the segments: anthers oblong-oval, cordate at base: ovary slightly crested.

Though occupying a place midway between *A. tribracteatum* and *A. parvum*, it differs from both these species in many ways. From the first it differs in narrower leaves, spathe valves 2, and these barely acute not acuminate, shorter and obtuser perianth segments considerably surpassing the stamens and beautifully papillate along the margins. From *A. parvum* it differs in reticulated bulb-coats, slender pedicels, shorter papillate perianth segments, smaller bulbs, and narrower leaves.

No. 3100. Open moist loose soil amongst rocks, at 8000 feet altitude, Sesesh Peak, Idaho County near Boise County, July 2, 1895.

Type in the National Herbarium at Washington; duplicate types in the herbaria of Idaho University and Harvard.

The type of *Calochortus nitidus* was collected by Douglas, "On the Chain of the Blue Mountains, and mountainous districts of the Columbia, from the confluence of the Spokan upwards." This is just the locality in which *Calochortus pavonaceus* Fernald was collected, and it is hardly to be doubted that the two species are identical. The figure in Dougl. Hort. Trans. **7**: p. 277 would seem to prove this. From Douglas' description we would also learn indirectly that the color of the flower is lilac, and from both description and figure that the plant is of a large stature. Points that Douglas did not bring out and which Mr. Fernald did, are the conspicuous spot on the inner segments, like the spot in a peacock's tail-feather, arching round the gland above, the suborbicular gland slightly wider than high, and, a thing no one seems to have noted, a decided scale below the gland, more or less covered and so disguised by the thick, yellow hairs of the gland.

Now the plant so common about the National Park, and radiating in all directions for many miles from this center, has so many points that differ from the type, that I propose it as a new variety, and as this was undoubtedly Watson's *C. eurycarpus*, a plant he afterwards reduced to *C. nitidus*, this may now stand as

CALOCHORTUS NITIDUS **eurycarpus**

Differs from the type of *C. nitidus* Douglas (*C. pavonaceus* Fernald), in smaller stature, flowers straw-colored to lilac-purple, in having a large round dark spot above the gland, not lunate as in type, in gland from oval to round, thus higher than wide, not wider than high as in *C. nitidus*, and in a narrower, almost invisible lacerately fringed scale.

Common from southern Idaho to the National Park, and collected in various localities during the summers of '95 and '99. Types in the National Herbarium at Washington, as well as in the herbaria of Idaho University and Harvard, nos. 3097, 3098 and 3099.

Anyone who should first examine a plant of the common *Smilacina racemosa* of the Eastern States, and then one of the *S. amplexicaulis* type from California, would unhesitatingly pronounce them separate species. The long narrow petiolate leaves and short style of the former are strikingly different from the ovate crowded sessile leaves and long style of the latter. And yet to one who has observed and studied these plants for years throughout Oregon, Washington and Idaho, these apparently well marked differences disappear, and intergrading forms of every description can be found. Around Portland, Oregon, can be found forms that differ not at all from the Eastern plant in leaves, flowers and fruit. In the same locality can be found other forms that differ only in slightly longer style. As you go south these forms gradually disappear and give place to the typical California plant about Ashland, Southern Oregon. Even with these marked intergrades, we might take still the California plant as a good species at one end of the string and *S. racemosa* of Portland as the other, were it not that in moving eastward, other perplexing forms arise. In the mountains about Moscow, Idaho, forms can be found on the south and exposed sides of the mountain with more or less of the *amplexicaulis* type, save the leaves are shortly petioled, and the style not so long as in the type. On the north and heavily wooded sides can be found plants of the *racemosa* type, but leaves not so long petioled, and style longer. (In the Gray Herbarium are many eastern forms of *S. racemosa*, that differ quite considerably in the length of petioles.) To make matters worse, in the Yakima country and in eastern Oregon are found types much like the Californian, but with styles as short or even shorter than the eastern *S. racemosa*. I therefore propose the following revision of this group:

1. SMILACINA RACEMOSA Desf., the eastern United States representative, extending west to the Pacific Ocean.

2. SMILACINA RACEMOSA AMPLEXICAULIS Watson, the common plant of California and southern Oregon with crowded ovate amplexicaul leaves and very long styles.

3. SMILACINA RACEMOSA **brachystyla.** Differing from the Californian plant only in the remarkably short style. The type of this variety I have transferred from my own herbarium to that of Harvard, where it will be more accessible. No. 4843.

After much study in the field and the examination of the immense number of specimens in the Gray Herbarium, I see no way to separate *S. sessilifolia* from *S. stellata* save in the length of the pedicels, a very trifling distinction. Forms can be found in the West that match the eastern forms in rootstock, size of fruit, more or less folded leaves which vary from acute to acuminate, and size of flowers. What therefore is left of specific value? I have even found some forms along the Snake River in Idaho that have pedicels no longer than in some extreme eastern forms, and would be considered typical *S. stellata* were the leaves not flat—a character I find by no means uniform in the eastern plants. The western plant is certainly not deserving of more than varietal rank, if even that, but on account of *generally* longer pedicels and longer and more acuminate leaves, I propose it as

SMILACINA STELLATA **sessilifolia**

Differs from the type in rather longer pedicels and in most cases in longer and more acuminate leaves.

ISOETES BOLANDERI **Sonnei**

Differs from the types as described by Engelmann in shorter, more rigid leaves, apparent absence of stomata, almost orbicular macro-sporangium spotted with small dark spots, and in the wide velum which covers from ⅓ to ⅔ of the sporangium.

Sent to me in 1887 by Mr. C. F. Sonne, who collected it in Donner Lake, California, in October of that year.

Were it not that the velum has been found by me to be a very variable and untrustworthy character in this genus, varying as it does in this plant from ⅓ to ⅔ the width of the sporangium, and in *I. nuda*, *I. Howellii*, and *I. Underwoodi* to such an extent as to make me credit the statement of Mr. A. A. Eaton, that they are all one species, I should be inclined to think this a species distinct from *I. Bolanderi.*

Type in my private collection; co-types distributed to unknown parties.

Isoetes occidentalis

Trunk bilobed: plant always submerged, without stomata: leaves few in small plants, 40–60 in large forms, spreading, rigid, tapering, quadrangular, acute or acuminate, not contracted above the sporangium, dark green, lacking bast-bundles, 10–20 cm. long in the same plant, or merely 5–6 cm. in the smaller: ligule narrowly triangular: velum covering about ⅓ the sporangium: macrospores 400–450 μ, finely crested with simple or confluent crests, or even mere prominences: microspores 30 μ long and very papillose to echinulate.

In a foot or two of water, but never emerging. Lake Cœur d'Alene, Idaho, August–Sept., 1897. No. 4786. Type in my private collection and in the herbaria of Columbia, Harvard and Idaho Universities.

This plant, or something extremely like it, exists in nearly all the lakes in the Northwest. It has been referred to *I. lacustris*, as well as to *I. echinospora Braunii.* To the latter it bears very little resemblance, since the leaves are rigid, not giving way in the slightest when taken from the water, and the macrospores have never the spinules of that species.

To *Isoetes lacustris* it is certainly very near, perhaps too near for specific delimitation, but it differs from either the European or American forms of that species in the more numerous and tapering leaves, apparently thicker than any forms of *I. lacustris*, in the macrospores smaller and less conspicuously crested, but especially in the smaller and very rough microspores. Perhaps including Engelmann's var. *paupercula* as a small form. In other forms of apparently the same species the leaves are thicker, not so tapering, and merely acute. Such a form I collected many years ago in Lost Lake, near Mt. Hood.